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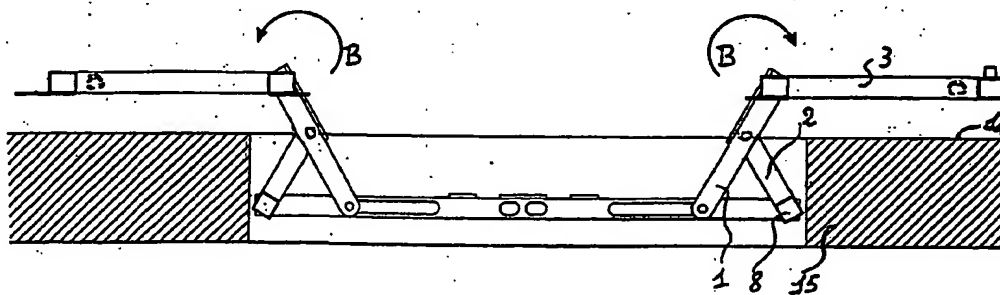
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(54) Title: DOOR OR WINDOW FITTED WITH A SUPPORT DEVICE



(57) Abstract: A door or window comprising a wing and a support and drive device for said wing comprising two mechanisms, each mechanism comprising: a lever (1,1') a sliding pin (9), adapted to slide in a guide (11) and integral with said lever, means for hinging (4) a wing to said lever; an arm (2) hinged to said lever in an intermediate position between said sliding pin and said means for hinging a wing, said arm being adapted to be hinged to a fixed structure (6), one mechanism being placed above and the other below said wing and hinged to the wing by said means.

DOOR OR WINDOW FITTED WITH A SUPPORT DEVICE.**TECHNICAL FIELD**

The present invention relates to a support and manoeuvring device for a wing of a door or window, for example of a door or gate and a door or window fitted with such a device.

In particular, the invention relates to a device that allows for the axis of rotation of the wing to be displaced into a position different from that occupied when the wing is closed.

BACKGROUND ART

In the door and window frame field, two or three different types of door or window are often present on the same door or window. A typical example can be observed in French windows or patio doors that give onto the exterior, when there is a glazed door or window towards the interior of the building that generally may be opened inwards, an outer shutter, with the wings hinged to the outer surface of the wall or on the outer edge of the opening that constitutes the window, wings that may be opened outwards. Sometimes, especially in the case of patio doors, a further door or window is required, generally positioned between the first two, which may be another door or a metal gate. Being there three doors or windows with one or two hinged wings, the opening of the third door or window, the one positioned between the other two, causes problems, due to interference with the other two doors or windows. Whilst the latter may be opened completely, that is until the wings are positioned against the inner or outer surface of the wall, next to the edge of the opening that constitutes the window, it is impossible to open an intermediate door or window in the same way, the hinges whose wings are, forcibly, fixed at a certain depth within the opening, to the lateral or upper and lower walls (near to the lateral walls) thereof. Therefore, the wings of said door or window in an open position will be arranged perpendicular or almost to the wall where the opening has been formed.

Even when the hinges are suitably positioned, that means very close to the inner or outer door or window, and/or with the axis of rotation of the wing distant from the wall, perhaps with portions of the door or window fixed between the hinges and the lateral wall, the inconvenience can be reduced, but not eliminated. For this

reason, the open wings are of a considerable nuisance and hindrance.

Another solution involves a hinge external to the opening positioned on its edge, to which the wing is connected by a bracket with which it is integral. This involves problems in positioning the outer door or window (if the intermediate one opens, as is often desirable, outwards) and can require the adaptation of the external door or window to the presence of the hinges of the intermediate door or window, for example with holes or cavities made on the inner part of the outer door or window, in order to house these hinges.

Another solution commonly adopted consists in fixing the hinges that support the wing to the ends of two levers (one lower and one upper), whose second end is hinged in proximity of the lateral walls of the opening, in a position practically corresponding to that of the hinges of a door or window such as that described above. When the wing is closed, the levers are positioned above and below it and placed along the lower and upper edge of the wing. The wing results therefore hinged at a certain distance from the lateral edge. When it is opened, the levers position themselves perpendicular to the wall and the hinges that support the wing can thus reach a more external position in relation to the opening than the open wings of the door or window, in such a way that the wing can rotate until it is positioned parallel to the wing of the internal or external door or window. However, the fact that the wing is hinged not in the proximity of its lateral edge (which, with the wing closed, is close to the side wall of the opening), causes the presence of a wing portion, comprised between the hinges and the lateral edge that, with the wing opened, will protrude towards the opening, thus limiting its width. Moreover, this portion, upon closing the door or window can constitute a risk for anyone who inadvertently has a hand or foot in the proximity of the side wall of the opening. It can also be uncomfortable to manoeuvre a door with a double hinging system such as that described.

A similar solution to that described entails the use of articulated wings. In this way, the hindrance caused by the wing portion protruding in relation to the hinges is reduced. However, it is not possible to avoid a certain reduction of the width of the opening. Moreover, the articulation (essentially hinges positioned vertically along the wing), can be complicated to assemble, and can weaken the wing. This is

important in the event that the intermediate door or window is, as often occurs, a metal gate that must ensure a certain resistance to intrusions. Moreover, the presence of the articulation limits the possibility of choice of the door or window design.

- 5 With the adoption of the solutions described above, the presence of the closed intermediate door or window, even if the latter is an iron gate, can hinder or obstruct the opening of the outer door or window, if the intermediate one opens outwards as often happens.

It is therefore desirable to be able to construct a door or window to be positioned
10 between two other doors or windows, such as to make it possible to position the wings, when they are in an open position against the wings of the inner or outer door or window, substantially in a parallel position to the surfaces of the wall in which the opening of the window is formed, without the above mentioned inconveniences; it is equally desirable that the door or window permits outward
15 opening, thus reducing to a minimum the hindrance of the wings and without impeding the manoeuvre of the outer door or window, thus also permitting partial opening inwards (or vice versa if preferred). Moreover, it is suitable for example in the case of a gate or security door or window, to build it in such a way as to satisfy certain requirements concerning resistance against intrusion.

20 SUMMARY

The above mentioned drawbacks have now been solved by a door or window comprising at least::

a wing (3, 3') and two mechanisms each mechanism comprising:

a lever (1, 1') hinged to said wing;

- 25 a sliding pin (9) adapted to slide in a guide (11) and integral with said lever;

an arm (2) hinged to said lever in an intermediate position between said sliding pin and the hinging point of said wing, said arm being adapted to be hinged to a fixed structure (6), one mechanism being placed above and the other mechanism being placed below said wing.

- 30 Said fixed structure can be, for example, a masonry part or a frame fixed to a masonry part. According to a possible aspect of the invention, said guide is formed into said fixed part and can be, for example, a groove along which said sliding pin

can move.

The device is adapted to support and drive a door or window wing, which is able to rotate around an axis of rotation capable of translating; the two mechanisms are preferably positioned symmetrically with respect to a plane perpendicular to the axis of rotation of the wing (plane that remains fixed); the two mechanisms can preferably move in a specular way to said plane. According to a further aspect of the invention, the device comprises a bar, integral at both ends with the two arms of the two mechanisms.

The door or window may have one or more wings, and preferably two mechanisms for each wing are foreseen. The door or window can comprise parts that can be fixed within the opening of the door or window; for example, it can comprise two section bars, one upper and one lower, in which the guides for the sliding pins are formed, and on which the arms of the above mentioned device/s are hinged. The two section bars can be independently fixed to the walls of the opening or may be part of a suitably shaped frame, such as a rectangular frame.

For door or window it is intended any kind of door or window having wings, comprising metal gates and metal security closures for windows.

LIST OF THE DRAWINGS

The present invention will now be illustrated by the detailed description of preferred, but not exclusive, embodiments provided as examples, with the aid of the appended drawings wherein:

Figure 1 schematically illustrates a particular of a front view of a door or window according to the present invention.

Figures 2a, 2b, 2c and 2d schematically illustrate section plan views of a door or window according to the present invention.

Figures 3a and 3b schematically illustrate an adjustment mechanism for a pin of a wing and an adjustment mechanism for the housing of a pin of a wing in a lever of a device according to the present invention, respectively.

Figures 4a, 4b and 4c schematically illustrate a system for hinging a wing to a lever of a device according to the present invention.

Figure 5 schematically illustrates a temporary fixing system for a door or window according to the present invention.

Figure 6 schematically illustrates a particular of a plan view of a door or window according to a particular aspect of the present invention.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

In figure 1 a detail of a door or window according to the present invention is shown. The door or window is shown in a closed position with the wing 3 hinged to the lever 1 by the means for hinging 4. Such means can be, for example, a pin free to rotate in a hole. The pin may be integral with the wing 3 and the hole may be made in the lever or vice versa, according to requirements. The pin 9 enables the rotation of the lever 1 around its own axis and slides in a guide 11 (fig. 2C), which can be formed in a fixed structure 6 or a structure fixed to it. The fixed structure 6 can be an element fixed to a surface 10 of an opening formed in a wall, in this case the lower surface 10 of the opening; for example a bar or, preferably a section bar in which a guide 11 (for example, a groove) has been formed. The fixed structure may also be the same lower surface of the opening and the guide may be formed directly therein. The guide allows the sliding pin 9 to slide longitudinally, in a direction parallel to the plane of figure 1, which is also the plane parallel to the door or window in a closed position (door or window plane); the sliding pin 9 may be manufactured in any manner deemed suitable, for example it can be integral with a trolley that slides in the fixed structure 6, if the latter is a metal section bar; for example it can be a pin that is fixed to a trolley inserted into a section bar 6 prior to assembly. The pin may be screwed or fixed to the trolley in any suitable manner. If the guide 11 comprises a groove formed in a metal section bar or bar (as in figure 2c) it is also possible to position a sliding element integral with the sliding pin, capable of covering the groove; for example, this element may be a metal plate sliding on the outside of the section bar and shaped in such a way as to adapt to the upper external profile of the section bar.

The arm 2 is hinged to the lever 1, for example by means of the pin 5 at one end, whereas at the opposite end it is hinged to the fixed structure 6, for example by means of a pin 7.

As mentioned, the device can preferably present two mechanisms as described above, in particular a mechanism positioned below the wing, as shown in figure 1 and one positioned above, in a position that is practically specular to the one

shown. According to a preferred aspect of the invention, the arm 2 is joined to the arm of the other mechanism by the rotating bar 8, with which the two arms are integral. In this case, the rotating bar, the arms and the means of hinging of the arms can form a single piece.

5 Figures 2a, 2b, 2c and 2d illustrate a plan view of a door or window according to the invention, and a section view thereof according to a plane, perpendicular to the door or window plane, in the closed (fig. 2a), open (fig. 2d) position and in two intermediate positions (figs. 2b and 2c), which permits to describe the operation of the device. The figures represent a two-wing metal gate, however what will be
10 stated can be applied to any door or window with one or more wings. The figures represent the lower part of the door, however what is described below can also be applied to the upper part, which can be built in an analogous manner (except for certain details, which may, as described below, differ if deemed suitable).

In figure 2a, the gate is shown in a closed position. For convenience's sake, the
15 part numbered with 12 in the drawings will be hereinafter considered as the exterior, above the door or window as represented and the part 13 shown below as the interior. In actual fact, a preferred aspect of the invention is a device enabling the full opening of the door or window towards the outside of a building. However, the description would also be valid if opening was inwards, which is
20 possible if considered preferable.

According to a possible way of operating, the wings are first rotated inwards, around the means 4 of hinging. A push towards outside in the direction of the arrows A causes the movement of the mechanism of the device described above in the configuration of figure 2c, with translation of the sliding pin 9 in the guide 11, rotation of the arm 2 around the pin 7 and displacement of the lever 1 into the
25 position shown. At this point, it is possible to note how the position of the means 4 of hinging has moved outwards. The rotation of the wing in the direction of the arrows B in figure 2d permits complete outward opening. The movements of the two wings, although illustrated as simultaneous, are completely independent. It
30 can therefore be observed how the completely open wing can be positioned outside substantially parallel to the external surface 14 of the wall 15, even when the door or window is positioned inside the opening formed in the wall. It is also

possible to dimension the various parts of the door or window in such a way that the wings can be distant from the outer surface, so that the wings of an optional external door or window can be positioned between the wings 3 of the door or window according to the invention (also referred to as intermediate door or window) and the wall 15. The possibility of a partial rotation of the wings inwards is advantageous in the case of an external door or window that can be opened from inside; in fact, once the intermediate door or window is in the position illustrated in figure 2b, it is possible to open the optional outer door or window without hindrance and then complete the opening of the intermediate door or window.

Particularly when the door or window involved is a metal security gate, a series of systems against intrusions may be advantageously provided. For example, a system for preventing the displacement of the mechanisms in the opposite direction to that of normal use may be provided, such as the longitudinal plates 51 and 51', fixed to the wings, for example, welded along one side of the wings, which can rest against the rotating bars 8 and 8' when the door or window is closed. This gives the door or window greater sturdiness and prevents the displacement of levers 1 and 1' inwards, i.e. in the opposite direction to that in which they move during normal operation of the door or window; said plates may also be provided in the absence of the rotating bars 8 and 8', in this case they could rest against vertical fixed elements, that could be part of a fixed frame. The teeth 52 and 52' are an example of means for preventing the outward rotation of the wings when the mechanisms are in a closed position; they (dotted line in figures 2a – 2d) rest against the corresponding projections 53 and 53' positioned on the edge of the wings, upper and/or lower. If the mechanisms are in an open position (figures 2c and 2d) the teeth 52 and 52' and the projections 53 and 53' do not interfere, thus enabling the opening of the door or window outwards. It should be pointed out that the presence of the plates 51 and 51', combined with the system of teeth 52, 52' and the projections 53 and 53', when the door or window is closed with a lock, that blocks the central parts 55 and 55' of the wings in the closed position (figure 4a), can prevent the movement of the wings even if the wing hinging pins 4 are cut, thus providing valid protection against intrusions. The door or window preferably comprises a lock that may be of various types, such as to fasten the

wings to one another (if there are two of them) or to block the wings to the fixed parts 6, in a similar manner as for already known locks.

The small plates 54 and 54' can be fixed to the levers (or to the arms of the mechanisms). They can rest against the fixed element 6 (they can also be provided for the upper mechanisms) and also constitute an example of means for preventing the inverse movement of the mechanism, as well as to protecting the mechanism from breaking from outside when the door or window is closed.

The vertical plate 50, in gates with two wings, enables one of the wings 3 to block the other 3' while being closed, especially if only one of the wings is fitted with a lock; the vertical plate 50, if positioned externally, may also function as a protection for the lock.

The means for hinging the wings to the lever can be of various types. For example, when the door or window is fitted with a device with two mechanisms, one lower and one upper as specified above, there may be present removable pins in order to facilitate assembly. The pins can be fixed to the device's arms or to the wing. They may also provide systems for the adjustment of the position of the pins and/or of the corresponding housing in which they will be received (free to rotate), once assembly has been completed. For example, means may be provided for adjusting the position of the pin in a direction parallel to the upper and lower edges of the wing, preferably the lower one, and the vertical position of the housing destined to receive the pin in the mechanism lever; in this way it is possible to compensate deformations due, for example, to the weight of the wing itself, especially in the case of a metal gate wing.

According to a possible embodiment of the invention, a device for adjusting the pin 7 may be provided on the wing as shown in figure 3a. In a metal block 20, a housing 21 is formed, in which the pin 4 can travel in the direction of the arrows C. The pin 4 presents a threaded through hole, through which the screw 22 passes. The screw 22 passes through through holes, in which it can rotate freely, inside the walls of the block 20, holes that connect the housing 21 with the exterior. The head of the screw and the other end, to which a bolt is welded, hold the screw in the position indicated. By rotating the screw, the pin 4 travels in the housing 21. The block 20 is fixed (for example welded) in a suitable position in the wing 3 in

such a way that the head of the screw 22 is accessible from outside, through a special slit. Another slit enables the pin to protrude sufficiently. In general, the block 20 is fixed in the housing prior to the assembling of the wing, which may comprise, for example, four tubular parts cut at 45° at the ends and welded to form a rectangular frame.

Figure 3b schematically illustrates an adjustment system that can be associated to the lever 1 of the mechanism. The housing 41 designed to receive the pin 4 is formed in an externally threaded bush 40 that is screwed into a threaded hole of the lever 1. By rotating the bush 40, which can advantageously be driven with a socket head screw wrench, the height position of the housing 41 can be adjusted. The dowel 43, screwed into a hole transversal to that receiving the bush, holds the latter in position.

All or part of the rotating couplings can be fitted with anti-friction systems, if required. For example, the pins around which rotation takes place can advantageously be fitted with ball bearings or equivalent antifriction systems. In general, axial ball bearings can be positioned around the pins where deemed suitable, between an upper and a lower part, such as between the wing 3 and the lever 1, between the arm 2 and the fixed part 6, between the lever 1 and the arm 2.

A hinging system that can also be used, and that is advantageous for the upper part of the wing, provides a pin that can be dismantled, as illustrated in figures 4a and 4b. In a hole 31 in a portion of the wing 3, a portion that can be in metal sheet, is inserted, and welded as illustrated in the drawing, the piece 30 that has the configuration of a cylinder drilled in the bottom part 32 and a half cylinder in the upper part 33 that protrudes from the wing 3; the part presents the threaded hole 34. The part 35 of the hole 31 is destined to receive one end of semipin 36 illustrated in plan in figure 4b and having a height such that the other end is aligned with that of the piece 30 to form a cylinder with a longitudinal through hole, when positioned as described. By introducing a screw into the thus-formed through hole and screwing it into the threaded hole 34, a cylindrical pin is obtained which is useful for hinging the wing in a corresponding hole 37, formed on the lever 1" of a mechanism pertaining to a device according to the invention (figure 4c). In

this case, a cut 38 with a width less than the diameter of the hole 37 puts the hole in communication with the farthest edge 39 of the lever. In this way, even when the device is already mounted to the fixed part, it is possible to position a wing with a normal or adjustable lower pin such as that shown in figure 3 and an upper one as
5 the one now described, by first inserting the lower pin into the hole of the lower lever, positioning the upper pin 30 making the upper part 33 pass through the cut 38 in the hole 37 of the upper lever 1", positioning the semipin 36 through the hole 37 and fixing it with a screw as said above. Assembly is simple and the rotation of the pin in the hole, which takes place with the normal use of the door or window
10 cannot cause unscrewing thanks to the presence of part 30 fixed to the wing 3. It is to be noted that the assembly of the wing may be performed with the upper and lower mechanisms in an open position, as in figures 2c and 2d, which makes it comfortable and there are no hindrances because the wing can be oriented as preferred during assembly. The semipin 36 can be fitted with groove on the outer
15 surface 60, in the part destined to protrude from part 35 of the hole 31. In order to facilitate the removal, for example using the tip of a screwdriver.

For the assembly of a door or window as described, comprising two section bars as a fixed part, one upper and one lower, suitable to be fixed to the upper and lower walls of an opening made in a wall, and comprising devices according to the
20 invention comprising the rotating bars 8 and 8' fixed to the arms of the mechanisms, it is possible to proceed as follows. The rotating bars are hinged to the section bars, for example by introducing the pins in special holes formed on said section bars, thus forming a structure that is more or less rectangular that can be introduced into the opening. At this point the section bars can be fixed to the
25 walls of the opening. Fixing can also be temporarily performed using the system illustrated in figure 5, where a number of expanders 70 are inserted into the section bar 6 (for example two for each section bar). They present a nut 71 with a threaded through hole 72 and a dowel 73 mobile in the hole, that can be driven using a socket head screw wrench. The nut 70 is introduced into the section bar 6,
30 shown here in cross section, prior to assembly. The dowel can be driven from a hole 77 made in the section bar and can be pushed against the wall 10 of the opening in which the door or window is assembled. Even with just two expanders

70 mounted in one of the section bars, for example the upper one, a temporary blockage is obtained that allows to assemble the door or window, verifying accuracy. It is then possible to proceed by fixing the section bars by drilling the walls of the opening, through special holes present in the section bars and by
5 positioning suitable screws and screw anchors, for example. The channel 74 in the dowel 73 can be useful, since it permits to make holes in the wall and position screws, in correspondence with an expander 70, without having to remove it.

The sliding pins are mounted by fixing them to trolleys that have previously been introduced into the section bars. It is therefore possible to assemble the
10 mechanisms and the wings, this even if assembly is only temporary, as shown above, in such a way as to verify the correct position of the door or window.

The door or window according to the invention can also present articulated wings, each one composed of two parts 83, 84 and 83' and 84', as shown in figure 6, where further systems of teeth 80, 80' and projections 81 and 81' are necessary
15 for safeguarding the door or window against attempted intrusions, even in the event that the wing hinging pins are cut.

It should be observed that the door or window according to the invention, in the absence of means for preventing the inverse movement of the wings and mechanisms, can, if deemed preferable, function in the opposite direction, opening
20 inwards or outwards as desired.

CLAIMS

1. A door or window comprising at least:
a wing (3, 3') and two mechanisms each mechanism comprising:
a lever (1, 1') hinged to said wing;
5 a sliding pin (9) adapted to slide in a guide (11) and integral with said lever;
an arm (2) hinged to said lever in an intermediate position between said sliding pin
and the hinging point of said wing, said arm being adapted to be hinged to a fixed
structure (6), one mechanism being placed above and the other mechanism being
placed below said wing.
- 10 2. The door or window according to claim 1 wherein the two arms of the said two
mechanisms are integral with a rotating bar (8).
3. The door or window according to any of the previous claims, wherein means
(54, 54') are provided for preventing the movement of said mechanisms in a
direction contrary to that of normal use.
- 15 4. The door or window according to claim 3, wherein said means for preventing the
movement of said mechanisms in a direction contrary to that of normal use are
small plates (54, 54') fixed to the levers or to the arms of said mechanisms which
are adapted to rest against a fixed structure (6).
5. The door or window according to any of the previous claims comprising at least
20 one section bar (6) fixable to a wall (10) above or below an opening made in a
wall.
6. The door or window according to claim 5 comprising a device according to claim
2 or 3 and comprising two section bars as described above, one upper and one
lower.
- 25 7. The door or window according to claim 5 or 6, wherein the guides (11) for said
sliding pins (9) are made in said section bars.
8. The door or window according to any claim from 5 to 7 wherein said arms are
hinged to said section bars.
9. The door or window according to any of the previous claims comprising a lock
30 capable of blocking the central part (55, 55') of one or more wings in a closed
position.
10. The door or window according to claim 9 comprising means (51, 51', 53, 53',

52, 52') capable of preventing the movement of the wings when said lock is closed, even in the case of rupture of the means (4) for hinging the wings to the levers (1).

11. The door or window according to claim 2 and 12 wherein said means
5 capable of preventing the movement of the wings when said lock is closed, even in the case of rupture of the means (4) for hinging the wings to the levers (1), are longitudinal plates (51, 51') fixed along one side of the wings, adapted to rest against the rotating bars (8, 8'), teeth 52 and 52' fixed to said section bar (6) and protuberances (53 and 53') fixed to the wings, adapted to rest against one another
10 if said mechanisms are in the closed position and not interfering if said mechanisms are in an open position.

14. The door or window according to any of the previous claims with one wing.

15. The door or window according to any of the previous claims with two wings.

16. The door or window according to any of the previous claims having one or
15 more articulated wings.

17. The door or window according to any of the previous claims comprising means for the adjustment of height and/or position of the wing in relation to the other parts of the door or window.

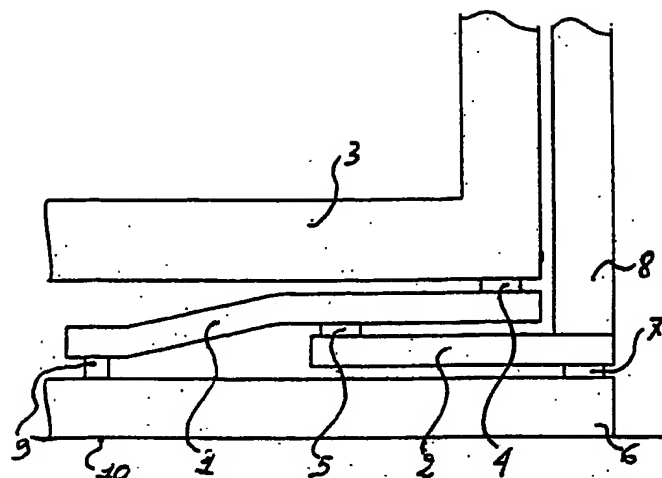


Fig. 1

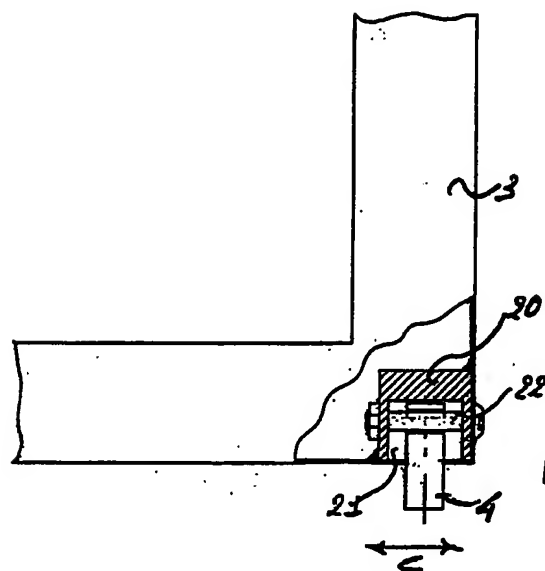


Fig. 3a

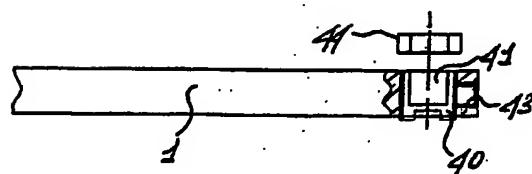
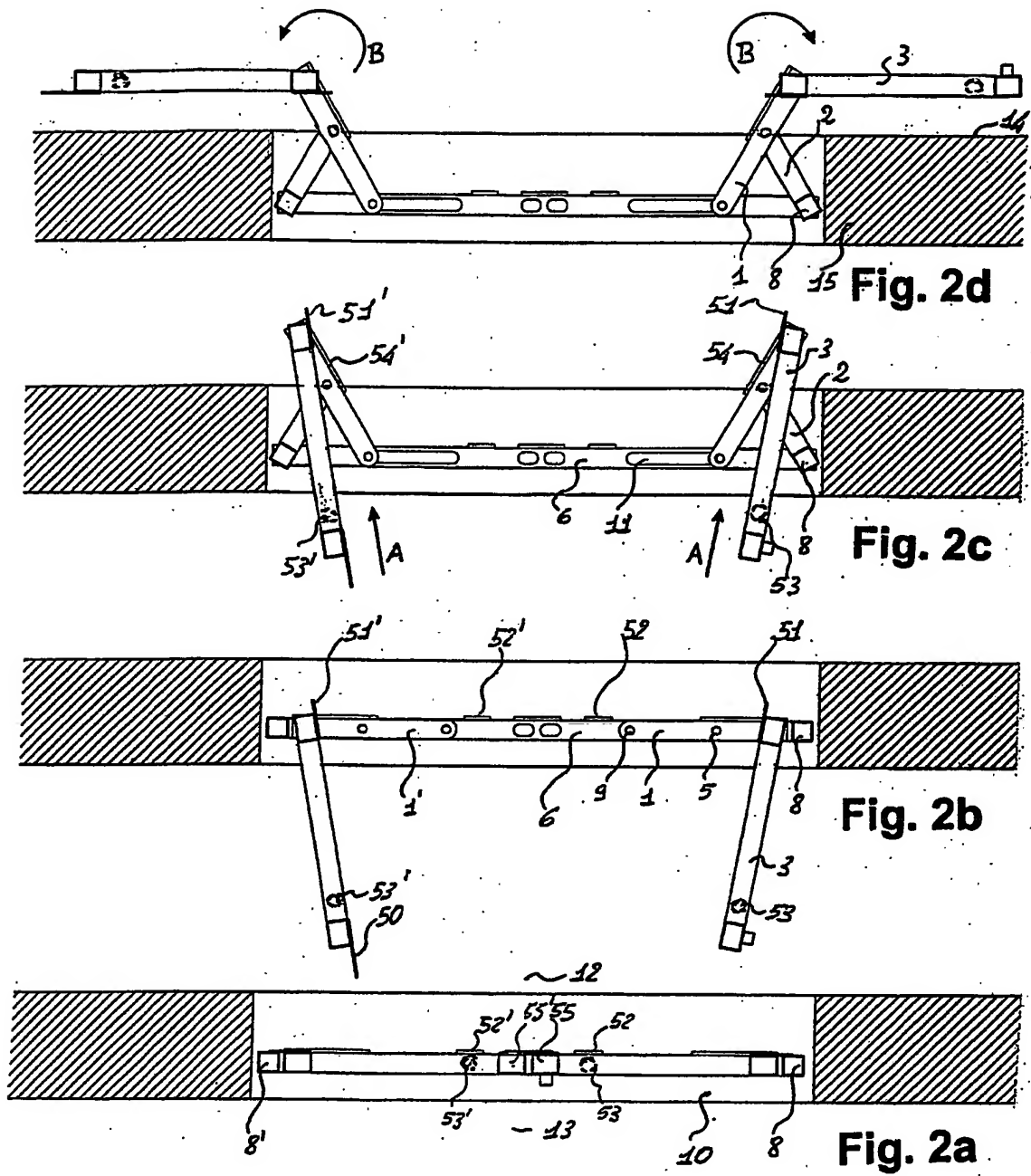


Fig. 3b



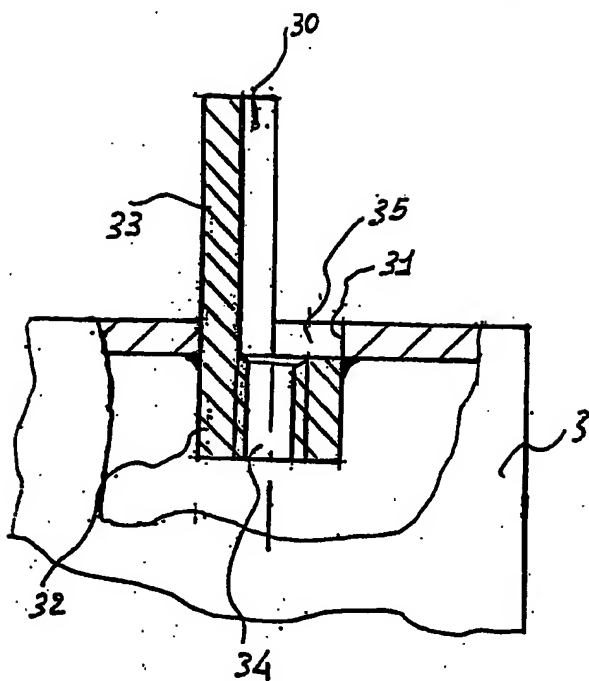


Fig. 4a

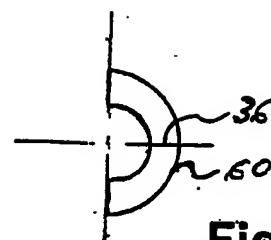


Fig. 4b

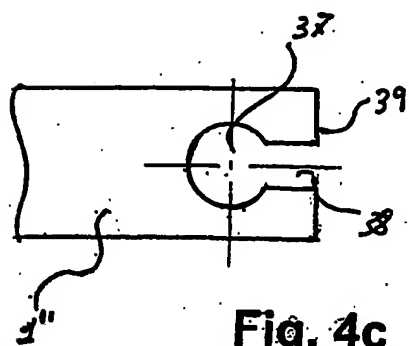


Fig. 4c

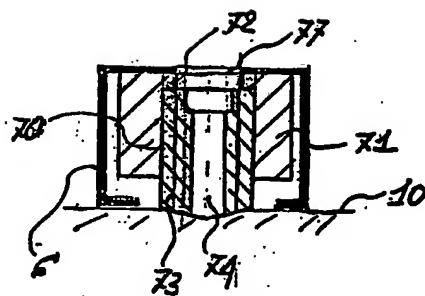


Fig. 5

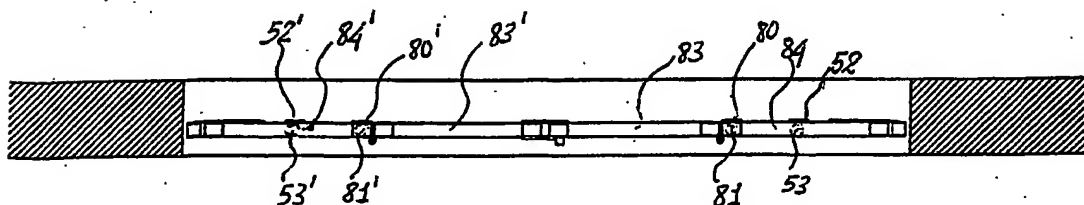


Fig. 6

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 03/14927

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 E05D15/48 E05D3/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 E05D E06B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 43 25 174 A (LIEBHERR HAUSGERAETE) 5 May 1994 (1994-05-05)	1,3, 5-10,14, 16
Y	column 6, line 44 -column 7, line 6; figure 3	2,15
Y	FR 2 537 198 A (FABRE FERNAND) 8 June 1984 (1984-06-08) page 1, line 25 - line 32; figures 1,6-16	2,15
X	FR 2 237 486 A (MAWHIN JEAN DENIS) 7 February 1975 (1975-02-07)	1,4-10, 14,16
Y	page 7, line 2 -page 8, line 6; figure 6	2
Y	US 1 778 134 A (WHITE HERBERT E) 14 October 1930 (1930-10-14) page 1, line 59 - line 67; figures 1-3	2
	--- -/--	

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

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P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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& document member of the same patent family

Date of the actual completion of the international search

26 April 2004

Date of mailing of the international search report

11/05/2004

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INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 03/14927

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 11 44 618 B (WILHELM FRANK G M B H) 28 February 1963 (1963-02-28) column 4, line 52 - line 60; figures 2,3,5 ---	1,4-10, 14,16
X	EP 1 164 242 A (NIEMANN HANS DIETER) 19 December 2001 (2001-12-19)	1,3
A	column 5, line 9 - line 30; figure 4 -----	5-8

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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FR 2537198	A	08-06-1984	FR 2537198 A1	08-06-1984
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